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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

HUGHES, SCOTT A

ART UNIT	PAPER NUMBER
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3663

DATE MAILED: 09/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/502,342

Applicant(s)

LEE ET AL.

Examiner

Scott A. Hughes

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 July 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-45 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-45 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 July 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 7/23/2004.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3, 6-10, 12-14, 28-29, 31-36, and 39-45 are rejected under 35 U.S.C. 102(b) as being anticipated by Chang (all references to Chang in this office action refer to Chang 5867451).

With regard to claim 1, Chang discloses an electronics-carrying module in a seismic data acquisition cable (Fig. 2). Chang discloses an electronics carrier having access means for providing an easy to reach access to a wrap-around circuitry fitted inside a curved space within the electronics carrier (Figs. 2, 5, 6a, 6b) (Column 3, Line 65 to Column 4, Line 40). Chang discloses a pair of rigid end-fittings (Figs. 2, 5, 6a-b) spaced apart axially by the electronics carrier for connecting to a section of the seismic data acquisition cable (Column 4, Lines 1-28, Column 4, Line 60 to Column 5). Chang discloses an axial hole formed in the electronics carrier and the rigid end-fittings defining the curved space between the axial hole, the access means and the rigid end fittings (Figs. 2, 5). Chang discloses that the axial hole is formed for accommodating a cable with an uninterrupted strength member along the seismic data acquisition cable through the electronics-carrying module (Fig. 2) (Column 4). Chang discloses an inner tube 42 (Fig. 4) enclosing a major portion of the axial hole and having at least one

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opening thereon for connecting the wrap-around circuitry to the cable for both power and signal transmission (Figs. 1-6) (Column 3, Line 65 to Column 5).

With regard to claim 2, Chang discloses that the access means comprises a first fractional fluid-resistant tube 78 fixed between the pair of rigid end-fittings, and a second fractional fluid-resistant tube 82 joined to the first fractional fluid-resistant tube by sealing means 102 so as to form the curved space between the inner tube and the access means (Column 3, Line 50 to Column 4, Line 40).

With regard to claim 3, Chang discloses that the second fraction fluid-resistant tube can be detached from the first fractional fluid-resistant tube by removing the sealing means (Column 4) (Fig. 2).

With regard to claim 6, Chang discloses that the first tube is equal in volume to the second tube (Figs. 2, 5, 6).

With regard to claim 7, Chang discloses that the sealing means comprise an elastomer ring such as a rubber ring.

With regard to claim 8, Chang discloses that the sealing means comprise a waterproof sealant (Column 4). Chang discloses sealants to seal the apertures and spaces in which the cables, wires, and hydrophones are placed. Also, the screws that clamp together the two mounts 78 and 82 are described as fastening the mounts about the cable and that the end units grip the cable. This would provide a waterproof seal between the mounts and the cable.

With regard to claim 9, Chang discloses that the sealing means further comprise a plurality of securing means selected from the group consisting of screw, clip, band, magnet, suction, and adhesive material (Column 4) (Fig. 2).

With regard to claim 10, Chang discloses that the access means is a moveable open-ended cylinder (Figs. 2, 5) having a diameter slightly larger than the diameter of the section of cable so that cylinder can slide away and that the moveable cylinder is attached to the end-fittings and can be detached by removing the means of sealing (screws) (Figs. 2, 5) (Columns 3-5).

With regard to claim 12, Chang discloses that the sealing means comprise a waterproof sealant (Column 4). Chang discloses sealants to seal the apertures and spaces in which the cables, wires, and hydrophones are placed. Also, the screws that clamp together the two mounts 78 and 82 are described as fastening the mounts about the cable and that the end units grip the cable. This would provide a waterproof seal between the mounts and the cable.

With regard to claim 13, Chang discloses that the securing means comprises screws (Figs. 2, 5).

With regard to claim 14, Chang discloses that the inner tube is a cylindrical tube (Figs. 2-4).

With regard to claim 28, Chang discloses that the wrap-around circuitry includes a data acquisition unit 14 (Column 6).

With regard to claim 29, Chang discloses that the wrap-around circuitry includes an analog to digital converter (Column 6, Lines 20-25). Chang discloses that the hydrophone transduces the acoustic (analog) signals into electrical signals (digital).

With regard to claim 31, Chang discloses that the wrap-around circuitry includes a data transmission unit (Column 6, Lines 15-30).

With regard to claim 32, Chang discloses that the wrap-around circuitry includes active control circuitry (Column 3, Column 6).

With regard to claim 33, Chang discloses that the wrap-around circuitry includes power supply circuitry (Column 3, Lines 15-35; Column 5, Lines 40-55; Column 6). Chang discloses power distribution wires in the cable, and it would have been obvious to supply the hydrophones with power through the circuitry from the cable in order to be able to operate the hydrophones to collect seismic data.

With regard to claim 34, Chang discloses that the section of the seismic data acquisition cable comprises a portion of the cable and an outermost protective layer 28 around the portion of the cable for protecting the cable from the outside environment (Column 3, Lines 36-50).

With regard to claim 35, Chang discloses that the rigid end-fitting is connected to the section of the seismic data acquisition cable by clamping the outermost protective layer to the rigid end-fitting (Column 3, Column 5, Lines 40-55).

With regard to claim 36, Chang discloses that the section of the cable further comprises a buoyant segment 24 formed to fill the void underneath the outermost

protective layer for providing a desired buoyancy level (Column 3, Lines 25-65) (Figs. 2-5).

With regard to claim 39, Chang discloses that the buoyant segment includes a solid material such as polyurethane composite (Column 3, Lines 25-65) (Figs. 2-5).

With regard to claim 40, Chang discloses that the buoyant segment includes a gel-type material (Column 3, Lines 25-65) (Figs. 2-5).

With regard to claim 41, Chang discloses an electronics-carrying module. Chang discloses a carrier defining a space for housing of electronics (Columns 4-5) (Figs. 2, 5, 6). Chang discloses selectively removable access means 118, 74, 178, 56, 168, 102 engagable with the carrier so as to provide access to the space (Fig. 2). Chang discloses a pair of end-fittings spaced apart axially by the carrier for connection of the module to a section of a cable (Column 3, Lines 50-65; Column 4, Lines 1-40; Column 5). Chang discloses that the cable has an axially extending strength member 52 (Fig. 3). Chang discloses a hole disposed along the module between the end-fittings, the hole being sized so as to accommodate threading of the cable through the module such that the strength member extends through the module (Figs. 2, 5). Chang discloses an inner tube 42 (Fig. 4) enclosing a major portion of the hole and having at least one opening 36 (Fig. 2) thereon for connecting the electronics to the cable. Chang discloses an access means being operable to provide access to the space without decoupling or removing the module from the cable (Fig. 2) (Columns 4-5).

With regard to claim 42, Chang discloses that the carrier has a substantially cylindrical outer shell 78 (Fig. 2).

With regard to claim 43, Chang discloses that the curved space is disposed intermediate the hole and the outer shell (Column 4, Lines 1-40; Column 5).

With regard to claim 44, Chang discloses that the electronics is wrap-around circuitry (Fig. 6a).

With regard to claim 45, Chang discloses that the access means is operable to provide access to the space without decoupling of the streamer at a termination point (Fig. 2) (Columns 4-5).

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 15-21, 23, 25, 28, 30-34, 36, 38, and 39-41 are rejected under 35 U.S.C. 102(e) as being anticipated by Rouquette.

With regard to claim 1, Rouquette discloses an electronics-carrying module 14 in a seismic data acquisition cable 2 (Fig. 2). Rouquette discloses an electronics carrier having access means for providing an easy to reach access to a wrap-around circuitry fitted inside a curved space within the electronics carrier ([0113]). Rouquette discloses a pair of rigid end-fittings spaced apart axially by the electronics carrier for connecting to a section of the seismic data acquisition cable (Fig. 2). Rouquette discloses an axial

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hole formed in the electronics carrier and the rigid end-fittings defining the curved space between the axial hole, the access means and the rigid end fittings (Fig. 2) ([0113]).

Rouquette discloses the cable going through the electronic module, and therefore there is an axial hole through which this cable passes. Rouquette discloses that the axial hole formed for accommodating a cable with an uninterrupted strength member along the seismic data acquisition cable through the electronics-carrying module ([0113]).

Rouquette discloses a continuous streamer cable, and it is well known in the art that streamer cables include strength members. Rouquette discloses an inner tube enclosing a major portion of the axial hole and having at least one opening thereon for connecting the wrap-around circuitry to the cable for both power and signal transmission ([0136]; [0226]; [0133]).

With regard to claim 15, Rouquette discloses that the inner tube is a polygonal tube (Fig. 18) ([0056]).

With regard to claim 16, Rouquette discloses that the wrap-around circuitry comprises a first circuit board with a connection for connecting the wrap-around circuitry to the cable through the opening, and a means for securing the first board to the inner tube ([0113]; [0133], [0136], [0226]).

With regard to claim 17, Rouquette discloses that the wrap-around circuitry further comprises a second circuit board joined to the first circuit board by a connection means ([0113]; [0133], [0136], [0226]).

With regard to claim 18, Rouquette discloses that the wrap-around circuitry further comprises a plurality of other circuit boards joined one to another to the first circuit board by connection means ([0113]; [0133], [0136], [0226]).

With regard to claim 19, Rouquette discloses that the connector means comprise a bendable conductor selected from the group consisting of a bunch of wires in a ribbon cable and a flexible printed circuit board ([0113]; [0133], [0136], [0226]).

With regard to claim 20, Rouquette discloses that the connection means comprise a fixed connector such as a pin-socket ([0113]; [0133], [0136], [0226]).

With regard to claim 21, Rouquette discloses that the first circuit board is a rigid circuit board ([0113]; [0133], [0136], [0226]).

With regard to claim 23, Rouquette discloses that the second circuit board is rigid ([0113]; [0133], [0136], [0226]).

With regard to claim 25, Rouquette discloses that the plurality of other circuit boards are rigid ([0113]; [0133], [0136], [0226]).

With regard to claim 28, Rouquette discloses that the wrap-around circuitry includes a data acquisition unit (abstract, [0004]).

With regard to claim 30, Rouquette discloses multiplexing the data ([0126]).

With regard to claim 31, Rouquette discloses that the wrap-around circuitry includes a data transmission unit (abstract, [0004]).

With regard to claim 32, Rouquette discloses that the wrap-around circuitry includes active control circuitry ([0002]; [0048]).

With regard to claim 33, Rouquette discloses that the wrap-around circuitry includes power supply circuitry (abstract).

With regard to claim 34, Rouquette discloses that the section of the seismic data acquisition cable comprises a portion of the cable and an outermost protective layer 15 around the portion of the cable for protecting the cable from the outside environment ([0113]).

With regard to claim 36, Rouquette discloses that the section of the cable further comprises a buoyant segment formed to fill the void underneath the outermost protective layer for providing a desired buoyancy level ([0170]).

With regard to claim 38, Rouquette discloses that the buoyant segment includes a liquid material such as a hydrocarbon fluid ([0170]).

With regard to claim 39, Rouquette discloses that the buoyant segment includes a solid material such as polyurethane composite ([0170]).

With regard to claim 40, Rouquette discloses that the buoyant segment includes a gel-type material ([0170]).

With regard to claim 41, Rouquette discloses an electronics-carrying module. Rouquette discloses a carrier defining a space for housing of electronics. Rouquette discloses selectively removable access means engagable with the carrier so as to provide access to the space. Rouquette discloses a pair of end-fittings spaced apart axially by the carrier for connection of the module to a section of a cable. Rouquette discloses that the cable has an axially extending strength member. Rouquette discloses a hole disposed along the module between the end-fittings, the hole being

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sized so as to accommodate threading of the cable through the module such that the strength member extends through the module. Rouquette discloses an inner tube enclosing a major portion of the hole and having at least one opening thereon for connecting the electronics to the cable. Rouquette discloses an access means being operable to provide access to the space without decoupling or removing the module from the cable ([0113]; [0133], [0136], [0226]) (Fig. 2).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 4-5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chang.

With regard to claims 4-5, Chang does disclose that the first fractional fluid-resistant tube is larger or smaller in volume than the second fractional fluid-resistant tube. However, it would have been obvious to modify the two sections in Chang to make one smaller or larger than the other in order to accommodate other parts of the cable such as electronic sections or bird devices. Chang discloses the two fractional cables as being the same size, but one could be larger or smaller than the other as long as they still opened up enough to be able to insert the cable and close the electronics carrying module around it.

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chang as applied to claims 1 and 10 above, and further in view of Copeland.

With regard to claim 11, Chang does not disclose that the sealing means comprise a rubber ring. Chang discloses sealing the cylinder by the use of screws and the pressure between the raised ribs and the cable (Column 4). Copeland discloses the use of elastomeric O-rings for sealing in seismic streamers (Columns 6, 7, 9). It would have been obvious to use O-rings between the cable and the electronics device in Chang as taught by Copeland in order to be able to securely seal the connection from water all the way around.

Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chang as applied to claim 1 above, and further in view of Rouquette.

With regard to claim 15, Chang does not disclose that the inner tube is a polygonal tube. Chang discloses a cylindrical inner tube. Rouquette discloses that the inner core of the cable could be in the shape of a triangle. It would have been obvious to modify the inner tube of Chang to fit around any shape of the inner core of the cable, such as the triangle shape disclosed by Rouquette.

Claims 16-21, 23, 25 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chang as applied to claims 1 and 10 above, and further in view of Pearce.

With regard to claim 16, Chang does not disclose that the wrap-around circuitry comprises a first circuit board with a connection for connecting the wrap-around circuitry to the cable through the opening, and a means for securing the first board to the inner tube. Chang discloses that the circuitry is made up of lead ins and wires from the hydrophone to the main cable (Figs. 2, 6). Pearce discloses a seismic streamer with hydrophones that also includes circuitry connecting the hydrophone and the main cable electronics. Pearce discloses the use of circuit boards with the hydrophones and their circuitry (Column 5, Line 53 to Column 6, Line 10). It would have been obvious to modify Chang to include circuit boards as part of the circuitry in the recess with the hydrophones as taught by Pearce in order to preamplify and precondition the signals before they are sent to the main cable.

With regard to claims 17 and 18, Chang does not disclose that the wrap-around circuitry further comprises a second circuit board joined to the first circuit board by a connection means. Pearce discloses connecting the first circuit board to additional circuit boards (pre-amplifier, signal conditioner, A/D converter, means to pass the signals on) (Column 5, Line 53 to Column 6, Line 10).

With regard to claim 19, Chang does not disclose that the connector means comprise a bendable conductor selected from the group consisting of a bunch of wires in a ribbon cable and a flexible printed circuit board. Pearce discloses connecting the circuit boards by means of a wire bundle (read as a bunch of wires in a ribbon cable) (Column 5, Line 53 to Column 6, Line 10).

With regard to claim 20, Chang does not disclose that the connection means comprise a fixed connector such as a pin-socket. It is known in the art that one method of connecting wires together includes the use of pin in socket (see Copeland - abstract).

With regard to claims 21, 23, and 25, Pearce discloses rigid circuit boards (Column 5, Line 53 to Column 6, Line 10).

With regard to claim 27, Chang does not disclose that the wrap-around circuitry includes amplifying circuitry. Pearce discloses amplifying circuitry as part of the circuitry used with hydrophones in streamers in order to amplify the signal before it is sent the main wire bundle for processing (Column 5, Line 53 to Column 6, Line 10).

With regard to claim 30, Pearce discloses

Claims 22, 24, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chang in view of Pearce as applied to claims 1 and 16-20 above, and further in view of Billet.

With regard to claims 22, 24, and 26 Chang does not disclose that circuit boards are flexible circuit boards. Billet discloses the use of flexible printed circuits in seismic streamers (abstract, Column 2). It would have been obvious to modify Chang to include flexible printed circuits as taught by Billet in order to be able to roll the circuit so as to mold it to the cylindrical shape of the streamer in which it is being placed.

Claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chang applied to claim 34 above, and further in view of Swenson.

With regard to claim 37, Chang does not disclose that the section of cable further comprises a layer of strength reinforcing member above the outermost layer, such as corrosion resistant steel wire ropes. Swenson discloses reinforcing a streamer cable with an outer strength layer 48 (Fig. 4) (Columns 2-3). It would have been obvious to modify Chang to include an outer layer of strength reinforcing members as taught by Swenson in order to provide an outer covering for the cable.

Claim 38 is rejected under U.S.C. 103 (a) as being unpatentable over Chang as applied to claim 36 above, and further in view of Williams.

With regard to claim 38, Chang does not disclose that the buoyant segment includes a liquid material such as a hydrocarbon fluid. Williams discloses that sections of seismic cable can be filled with liquid (Column 2, Lines 40-55). It would have been obvious to modify Chang to include a liquid filled section instead of the solid section as an alternative way to have a neutrally buoyant cable section.

Conclusion


The cited prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Scott A. Hughes whose telephone number is 571-272-6983. The examiner can normally be reached on M-F 9:00am to 5:30pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Keith can be reached on (571) 272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


SAH


JACK KEITH
PRIMARY EXAMINER
SPE 3663